

1-3 Motion Problems

$$D = r \times t$$

Basically 3 types

- Roundtrip
- Same direction
- Opposite direction

Roundtrip



Set distances equal

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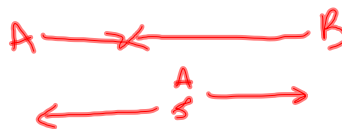
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Same Direction



Set distances equal

Opposite Direction



$$\text{Distance}_A + \text{Distance}_B = \text{Total Distance}$$

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Different

Look to see if anything is equal: Distance, rate, or time

Two Cars started from the same town and traveled east on the same road. They began their journey at 7am. One car averaged 41 mph, and the other car averaged 55 mph. In how many hours were they 84 miles apart?

	r	t	d
A	41	$t = \frac{d}{41}$	d
B	55	t'	$d + 84$

$\frac{d}{41} = \frac{d+84}{55}$
 $55d = 41(d + 84)$
 $d = 246$
 $t = \frac{246}{41}$

$d = r \cdot t$
 $\frac{d}{r} = t$

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1. Traveling by highways, Carrie's speed on her way to work is 60 km/h. If she uses local streets to drive the same distance, the trip takes 30 min longer and her speed is 36 km/h. How long does it take her to drive to work by highways?

	r	t	d
Highway	60	t	60t
Local	36	$t + \frac{1}{2}$	$36(t + \frac{1}{2})$

$60t = 36(t + \frac{1}{2})$

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4. Mr. Rush and Mr. Slow are flying towards each other. Mr. Rush's jet travels at 600 mph; Mr. Slow's jet travels at 320 mph. They leave their home airports, which are 1380 miles apart, at the same time. In how many hours will they meet?

	r	t	d
R	600	t	600t
S	320	t	320t

$600t + 320t = 1380$

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